

**A new genus for *Anapagrides* sensu De Saint Laurent-Dechancé, 1966  
(Decapoda: Anomura: Paguridae) and descriptions of  
four new species**

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*Abstract.*—*Anapagrides* De Saint Laurent-Dechancé, 1966, as originally diagnosed by its author, has recently been found not to agree with several essential characters of its type species, *Eupagurus* (*Spiropagurus*) *facetus* Melin, 1939. Since *Anapagrides* necessarily is restricted to the taxon exemplified by its type species, the new genus, *Laurentia*, is proposed for the four undescribed species previously referred to the former genus. These species are now fully described and the systematic relationship of *Anapagrides* sensu stricto to the new genus is discussed.

In a study of the hermit crabs of Maluku, Indonesia, collected during the *Alpha Helix* Expedition of 1975, to northern Australian and eastern Indonesian waters, Haig & Ball (1988) recognized and illustrated a species, referable to the genus *Anapagrides* as defined by De Saint Laurent-Dechancé (1966). Haig & Ball (1988) declined to describe or name their taxon as a new species in deference to Michèle de Saint Laurent, who had indicated, at the time of her original generic diagnosis (De Saint Laurent-Dechancé 1966) and subsequently (De Saint Laurent 1968), that three new IndoPacific species of *Anapagrides* remained to be described. Although De Saint Laurent-Dechancé (1966) based her diagnosis of *Anapagrides* on these undescribed taxa, she designated the nominal species *Eupagurus* (*Spiropagurus*) *facetus* Melin, 1939, as the type of the genus.

McLaughlin & Sandberg (1995) recently completed a review of three of Melin's (1939) species, including *Anapagrides facetus*. These authors found that Melin's species differed from De Saint Laurent-Dechancé's (1966) generic diagnosis to such a

significant extent, that a major emendation of *Anapagrides* was required. *Anapagrides* sp. of Haig & Ball (1988), while agreeing with *Anapagrides* sensu De Saint Laurent, can no longer be assigned to *Anapagrides* as emended. In addition to Haig & Ball's (1988) Maluku specimen, we have now been able to examine De Saint Laurent's undescribed species. These are described herein as new species in *Laurentia*, new genus.

Specimens for this review are from the Dutch *Siboga*, U.S. Philippine *Albatross*, U.S., and Australian/Indonesian *Alpha Helix* expeditions. The holotype of Haig & Ball's species has been deposited in the Indonesian National Institute of Oceanography, Jakarta (NIOJ). Specimens from the *Albatross* Expedition have been returned to the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), and the *Siboga* material to the Zoologisch Museum, Amsterdam (ZMA). One measurement, shield length (SL), measured from the tip of the rostrum to the midpoint of the posterior margin of the shield, provides an indication of animal size.

*Laurentia*, new genus

*Anapagridentes* De Saint Laurent-Dechancé, 1966:262 (in part).—Miyake, 1978:142 (in part), see remarks.

*Anapagridentes*: De Saint Laurent, 1968:1115.—Haig & Ball, 1988:177; not *Anapagridentes* De Saint Laurent-Dechancé, 1966.

*Type species*.—*Laurentia albatrossae*, new species. Gender: feminine.

*Diagnosis*.—Eleven pairs of trichobranchiate gills. Rostrum narrowly triangular, produced beyond bases of ocular acicles. Ocular acicles slender. Antennular peduncles with elongate ultimate segment often provided with 1 or more long setae at distal margin. Antennal peduncle with supernumerary segmentation. Maxillule with external lobe of endopod somewhat produced, not recurved. Crista dentata of third maxilliped without accessory tooth. Sternite of third maxillipeds unarmed, but with shallow median depression. Chelipeds unequal or subequal, right appreciably stouter. Ambulatory legs with elongate dactyls; carpi with dorsodistal spine. Fourth pereopods with single row of scales in propodal rasp. Sternite of fifth pereopods developed as single small subovate or subquadrate lobe. Coxa of left fifth pereopod in males with moderately long or long, sometimes coiled, sexual tube (Fig. 1E, F) provided with terminal tuft of stiff setae; right fifth coxa with gonopore; 3 uniramous or unequally biramous unpaired left pleopods. Females with paired gonopores; no paired pleopods, unpaired left pleopods on somites 2–5. Uropods markedly asymmetrical. Telson with transverse suture only weakly indicated; posterior lobes usually asymmetrical, terminal margins oblique; posterolateral margins delineated at least on left.

*Etymology*.—This genus is named in honor of the noted French carcinologist, Michèle de Saint Laurent.

*Remarks*.—Miyake (1978) included *Anapagridentes* sensu lato among the hermit crab genera reported from Japan. Although he

cited the gill structure as being phyllobranchiate, the remainder of his generic diagnosis was based on that of De Saint Laurent-Dechancé (1966); *A. facetus* was listed as the only species. Miyake (1978) gave no indication that he had any personal knowledge of the taxon.

*Laurentia albatrossae*, new species  
Figs. 1, 2, 3A, B

*Holotype*.—♂ (SL = 3.2 mm), Philippine Islands, Sulu Archipelago, 5.5 mi NW of Jolo Light, 06°09'N, 120°58'E, *Albatross* station 5141, 153 m; 15 Feb 1908; USNM 275922.

*Paratype*.—Ovigerous ♀ (SL = 1.97 mm), ? Banda, 9–36 m; ZMA Crust.: De.201763.

*Description*.—Shield (Fig. 1A) slightly longer than broad; anterior margin between rostrum and lateral projections concave; anterolateral margins sloping; posterior margin truncate; dorsal surface glabrous. Rostrum triangular, well developed, reaching nearly half length of ocular acicles, terminating subacutely. Lateral projections well developed, triangular, with submarginal spine. Ocular peduncles (including corneae) approximately  $\frac{1}{5}$  shield length; corneae slightly dilated. Ocular acicles subtriangular, with submarginal spine.

Antennular peduncles, when fully extended, overreaching ocular peduncles by  $\frac{3}{4}$  to nearly entire length of ultimate segment; ultimate segment with 1 or 2 long setae on dorsodistal margin; penultimate segment with 1 or 2 short setae; basal segment with statocyst region expanded laterally and dorsoventrally flattened, with distal hook-like process; dorsolateral margin with small distal spine.

Antennal peduncles overreaching ocular peduncles by approximately  $\frac{1}{2}$  length of ultimate segment. Fifth and fourth segments with few long setae. Third segment unarmed or with small ventrodorsal spinule. Second segment with dorsolateral distal angle produced, terminating in acute spine and with small secondary spine on mesial

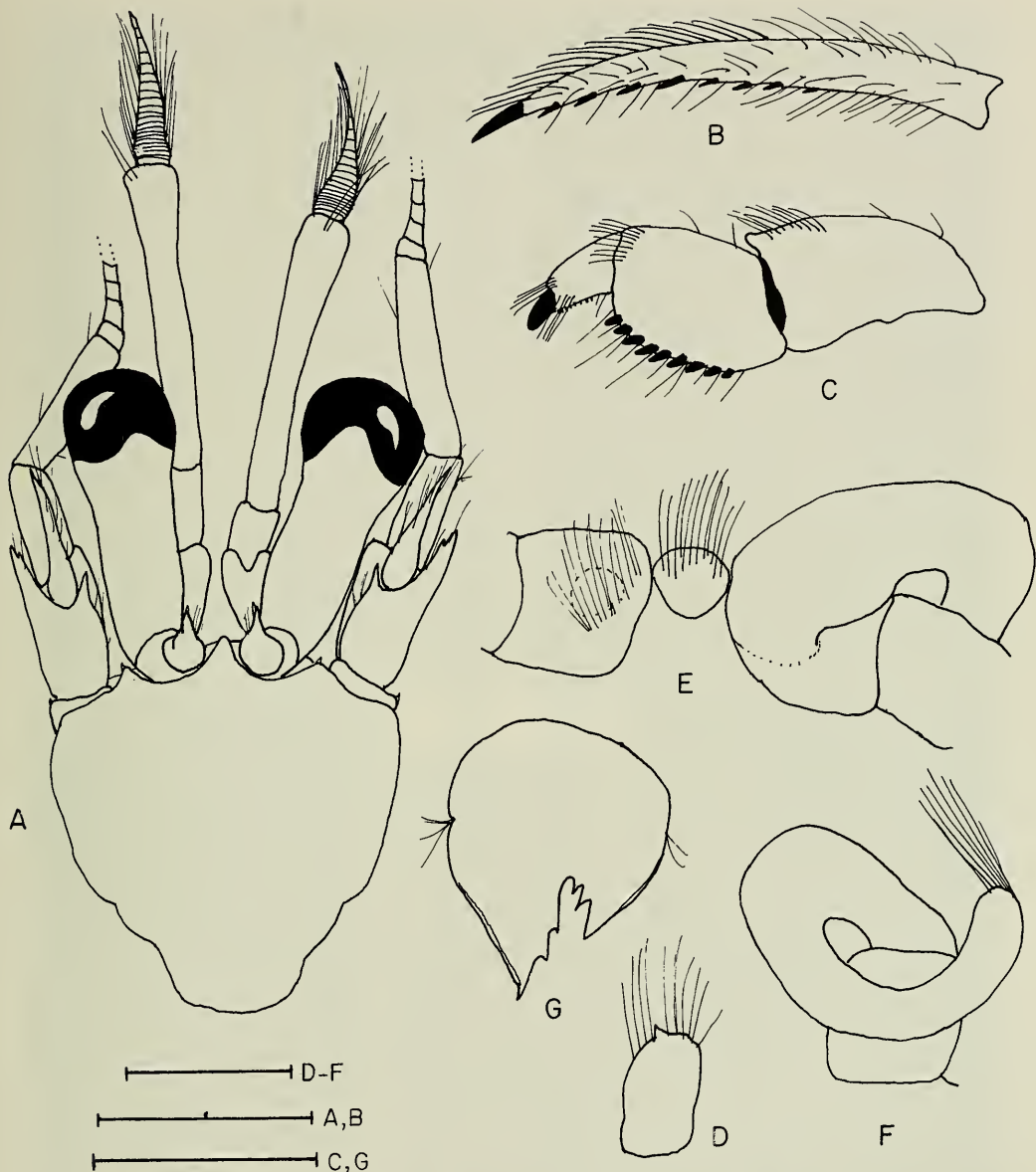


Fig. 1. *Laurentia albatrossae*, new species. Holotype, USNM 275922: A, shield and cephalic appendages; B, dactyl of second right pereopod (mesial view); C, dactyl, propodus and carpus of left fourth pereopod (lateral view); D, anterior lobe of sternite of third pereopods; E, coxae and sternite of fifth pereopods (ventral view); F, coxa of left fifth pereopod and sexual tube (dorsal view); G, telson. Scales equal 2.0 mm (A, B), 1.0 mm (C, E-G), and 0.5 mm (D).

margin distally; dorsomesial distal angle with prominent acute spine. First segment sometimes with spinule at dorsolateral distal angle; small spine on ventrolateral margin distally. Antennal acicle reaching to

base of cornea or slightly beyond; terminating in acute spine and with long setae on mesial margin. Antennal flagellum with 2 or 3 long and sometimes 1 or 2 shorter setae every 1 to 3 articles.

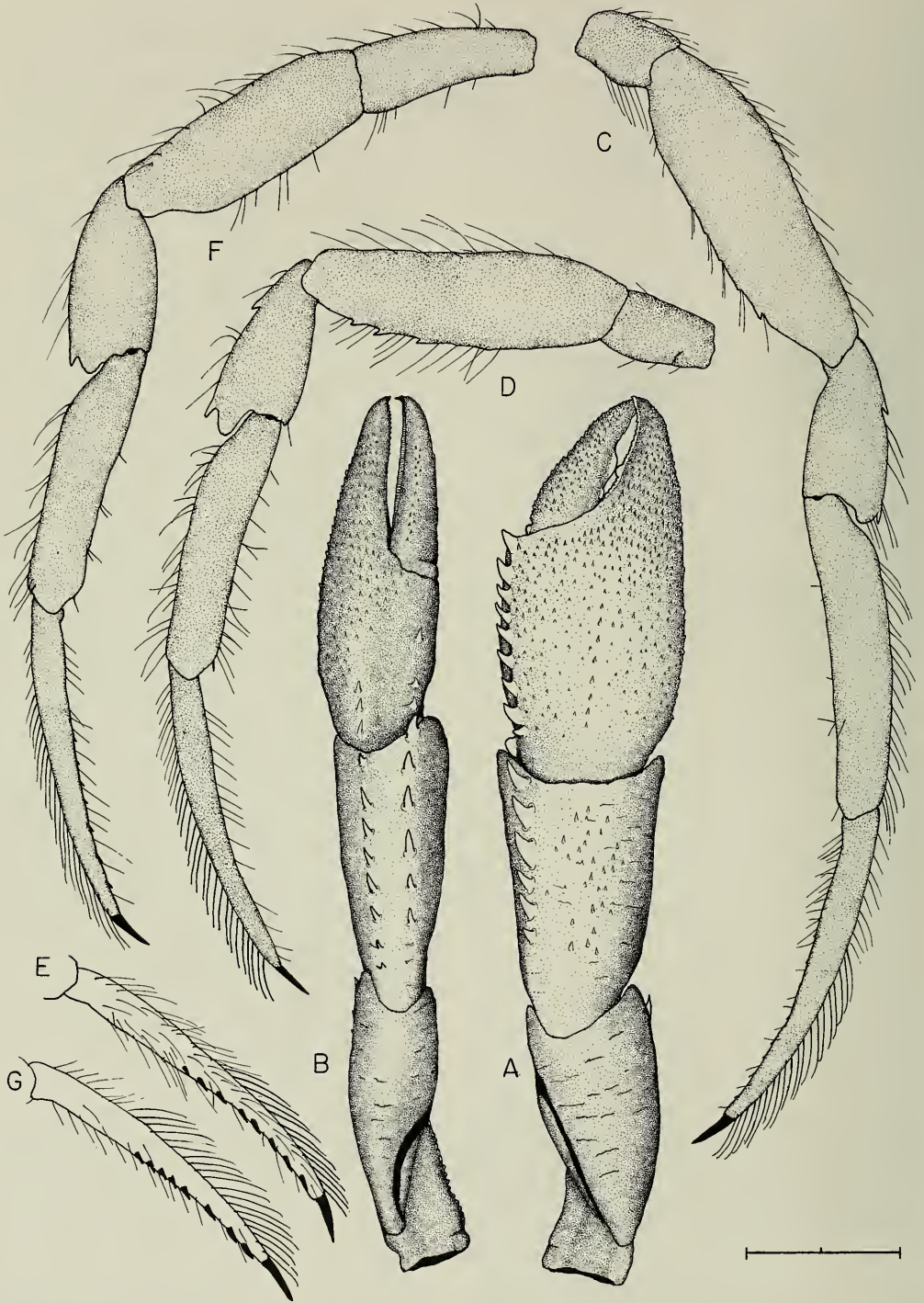


Fig. 2. *Laurentia albatrossae*, new species. Holotype, USNM 275922: A, right cheliped (setae omitted); B, left cheliped (setae omitted); C, right second pereopod (lateral view); D, left second pereopod (lateral view); E, dactyl of left second pereopod (mesial view); F, left third pereopod (lateral view); G, dactyl of left third pereopod (mesial view). Scale equals 2.0 mm.

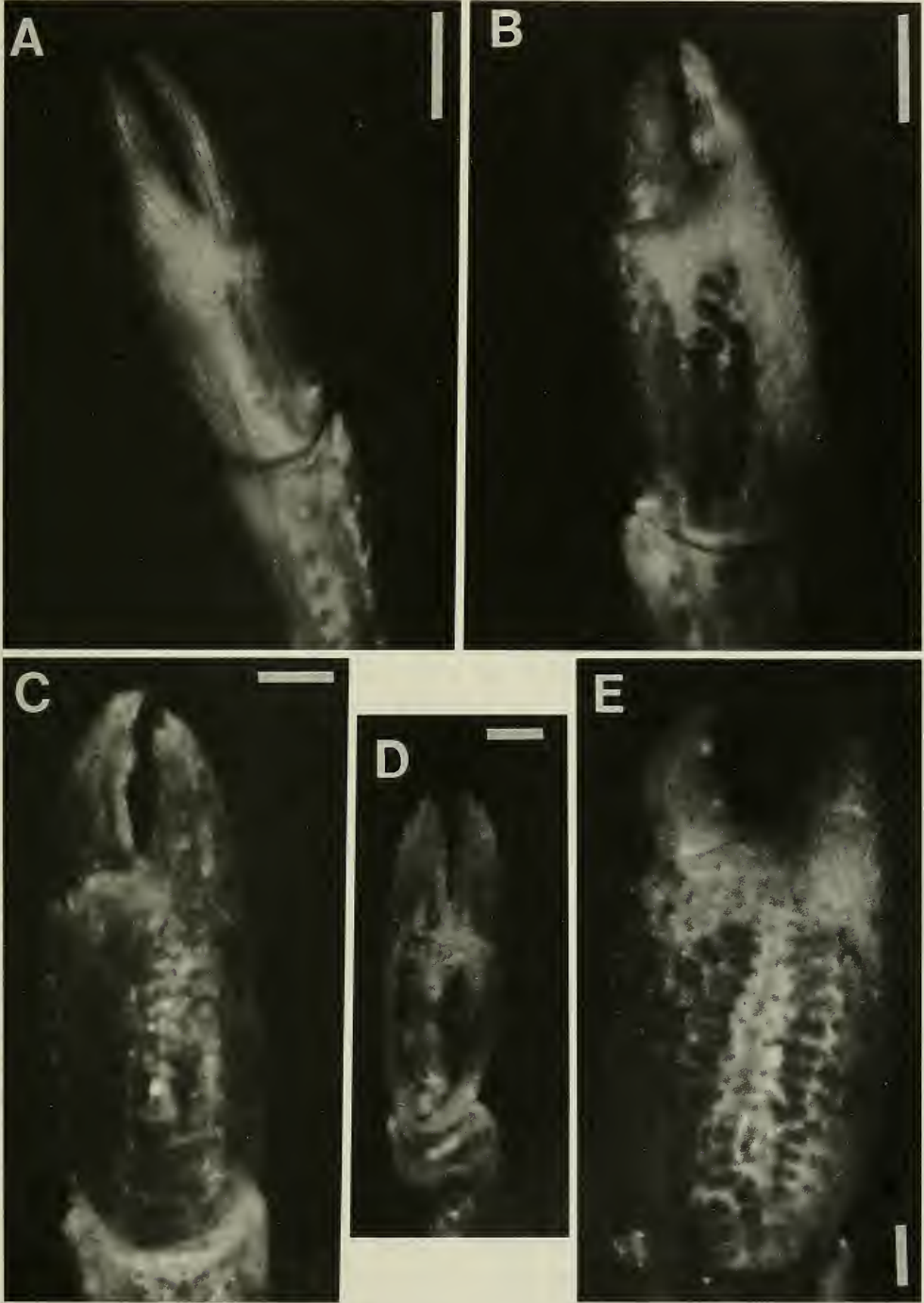


Fig. 3. Chelipeds of species of *Laurentia*, new genus. *L. albatrossae*, new species: holotype, USNM 275922: A, left cheliped; B, right cheliped. *?L. albatrossae*: ♂, ZMA: C, right cheliped; D, left cheliped. *L. senticosa*, new species: holotype, ZMA: E, right cheliped. Scales equal 1.0 mm (A, B); 0.5 mm (C); and 0.25 mm (D, E).

Crista dentata with 10 to 15 regularly-spaced, small teeth.

Right cheliped [Figs. 2A (setae omitted), 3B] moderately elongate, rather slender. Dactyl approximately  $\frac{4}{5}$  length of palm; cutting edge with 1 small calcareous tooth proximally and 1 prominent calcareous tooth near mid-margin, row of very small calcareous teeth distally; terminating in very small corneous claw; dorsomesial margin not clearly delimited; dorsal surface convex, armed with numerous, scattered small spines or very fine spinules extending onto mesial face dorsally, and partially obscured by long setae; ventral surface with scattered long setae. Palm only slightly shorter than carpus; dorsomesial margin with row of slender, sometimes irregular, acute spines and long setae, dorsal surface convex, armed with scattered small spines and fine spinules practically obscured by long setae, dorsolateral margin with long setae proximally, but with small spines or fine spinules distally and on fixed finger; dorsal surface of fixed finger with scattered fine spinules also obscured by long setae, cutting edge with 1 calcareous tooth in proximal half, very small calcareous teeth distally, terminating in small weakly calcified claw. Carpus slightly longer than merus; dorsomesial margin with short, transverse rows of long setae proximally and more distal row of moderately slender, acute spines, dorsal surface with 3 very irregular rows of small spinules, decreasing in size laterally, dorsolateral margin not delimited; mesial face with transverse rows of long setae, lateral and ventral surfaces also with transverse rows of long setae, but fewer in number. Merus with transverse rows of setae on dorsal surface, extending onto lateral face dorsally; ventrolateral margin with 1 prominent and 1 smaller spine distally, ventromesial margin with 1 prominent spine at distal angle, 1 spine at midlength, and 1 transverse setal row and smaller spine proximally. Ischium with row of transverse setal tufts adjacent to mesial margin ventrally. Coxa with prominent spine on ven-

trolateral distal angle and second, smaller spine on ventromesial margin in distal half.

Left cheliped [Figs. 2B (setae omitted), 3A] (missing in paratype) slender, not much shorter than right. Dactyl approximately  $\frac{1}{4}$  longer than palm; cutting edge with row of very small corneous teeth, terminating in corneous claw; dorsal surface with irregular, nearly double row of very small spinules in midline, partially obscured by long setae, dorsomesial margin rounded and armed with scattered tiny spinules. Palm about  $\frac{2}{3}$  length of carpus, dorsomesial margin with 3 acute spines, 2 proximally separated by broad space from medianly placed third spine, dorsal surface with numerous tiny spinules generally obscured by long setae and 3 slightly stronger spines proximally on weakly delimited dorsolateral margin; fixed finger with dorsal surface similarly armed with tiny spinules and long dense setae, cutting edge with row of very small calcareous teeth interspersed with corneous teeth, terminating in tiny corneous claw; ventral surfaces all with weakly defined transverse rows of long setae. Carpus approximately as long as merus; dorsomesial margin with row of slender, acute spines, dorsolateral margin with slightly smaller row of spines, both partially obscured by long setae; lateral and mesial faces with transverse rows of long setae, ventrolateral margin with small spine distally. Merus with long setae on dorsal, lateral and mesial surfaces; ventrolateral margin with 3 prominent acute spines and transverse rows of long setae; ventromesial margin with 1 spine near distal angle and 2 rather widely-spaced spines in proximal half. Ischium with long setae on ventral margin.

Second and third pereopods (Figs. 1B, 2C-G) (right third missing in holotype, both second pereopods missing in paratype) generally similar from left to right. Dactyls slightly longer than propodi, slender, in dorsal view slightly twisted, terminating in long, slender corneous claws; in lateral view curved ventrally; dorsal margins each with a row of stiff setae, mesial faces with

long setae, ventral margins also with long setae and with 5 to 8 corneous spines in distal half to  $\frac{2}{3}$ . Propodi with 1 or 2 corneous spines on ventrodistal margin, long setae dorsally and ventrally. Carpi each with 1 spine on dorsal surface adjacent to dorsodistal angle (third) and 1 additional spine on dorsal surface proximally (second). Meri each with 1 spine on ventral margin in distal third (second) or unarmed (third), dorsal margins with tufts of long setae. Ischia unarmed. Fourth pereopod (Fig. 1C) without preungual process; carpus with small spine at dorsodistal margin. Sternite of third pereopod (Fig. 1D) with small, subovate or subquadrate anterior lobe armed distally with 1 small spine. Sternite of fifth pereopods (Fig. 1E) semisubovate, with long distal setae.

Male pleopods unequally biramous; exopod well developed, endopod reduced. Telson (Fig. 1G) with posterior lobes strongly asymmetrical, each with prominent spine at outer angle (largest on left) and 1 or 2 additional spines on oblique terminal margin.

*Affinities.*—*Laurentia albatrossae* most closely resembles *L. senticosa*, new species in having the dorsal surfaces of the chelae armed with numerous tiny spines; however, the right chela of *L. albatrossae* is more elongate and slender than that of *L. senticosa*. The dorsomesial margin of the palm of the right cheliped of *L. albatrossae* carries a row of moderate to strong spines that are lacking in *L. senticosa*. Other distinguishing characters are pointed out under *L. senticosa*.

*Etymology.*—Named for the U.S. Fish Commission Steamer *Albatross*.

*Distribution.*—Philippines, Sulu Archipelago and Banda, Indonesia; 5 to 53 m.

*Remarks.*—In her original report on *Anapagrides* sensu lato, De Saint Laurent-Dechancé (1966:262) commented that a species collected in the Indo-Pacific by the *Albatross* and *Siboga* was very near Melin's (1939) species [*Eupagurus* (*Spiropagurus*) *facetus*] and that her genus *Anapagrides*

was proposed for the former and two other new species from the same region. Of the specimens from the three *Albatross* stations initially considered by De Saint Laurent, only one, from station 5141, actually represents *Laurentia*. One specimen, from *Siboga* station 99 [Sulu Archipelago, 6°7.5'N, 120°26'E], appears to be one of the specimens specifically referred to by De Saint Laurent-Dechancé (1966). It is a male (SL = 1.79 mm; ZMA Crust.: De.201764) that closely resembles *L. albatrossae*, but is now almost entirely lacking calcification, and morphological details are difficult to interpret. Therefore, we tentatively assign this specimen (Fig. 3C, D) to *L. albatrossae*, but do not consider it a paratype. The female paratype presumably from the *Siboga* Expedition carries only the label “? Banda, 5–20 fms” in what appears to be De Saint Laurent's hand writing.

#### *Laurentia sibogae*, new species

Fig. 4

*Holotype.*—♀, ovigerous (SL = 1.5 mm), Sailus Ketjil, Paternoster Island, “Siboga” station 37, dredged to 18 m, 30, 31 Mar 1899, ZMA Crust.: De.201762.

*Description.*—Shield (Fig. 4A) slightly longer than broad; anterior margin between rostrum and lateral projections distinctly concave; anterolateral margins terraced; posterior margin roundly truncate; dorsal surface glabrous. Rostrum well developed, appreciably overreaching lateral projections, triangular, terminating rather bluntly. Lateral projections prominently developed, obtusely triangular, with strong marginal or submarginal spine.

Ocular peduncles (including corneae) approximately  $\frac{3}{4}$  length of shield, moderately stout, corneae only slightly dilated. Ocular acicles narrowly triangular, terminating acutely and with small submarginal spine.

Antennular peduncles elongate, when fully extended, overreaching distal margin of cornea by approximately  $\frac{2}{3}$  length of ultimate segment. Ultimate segment with few

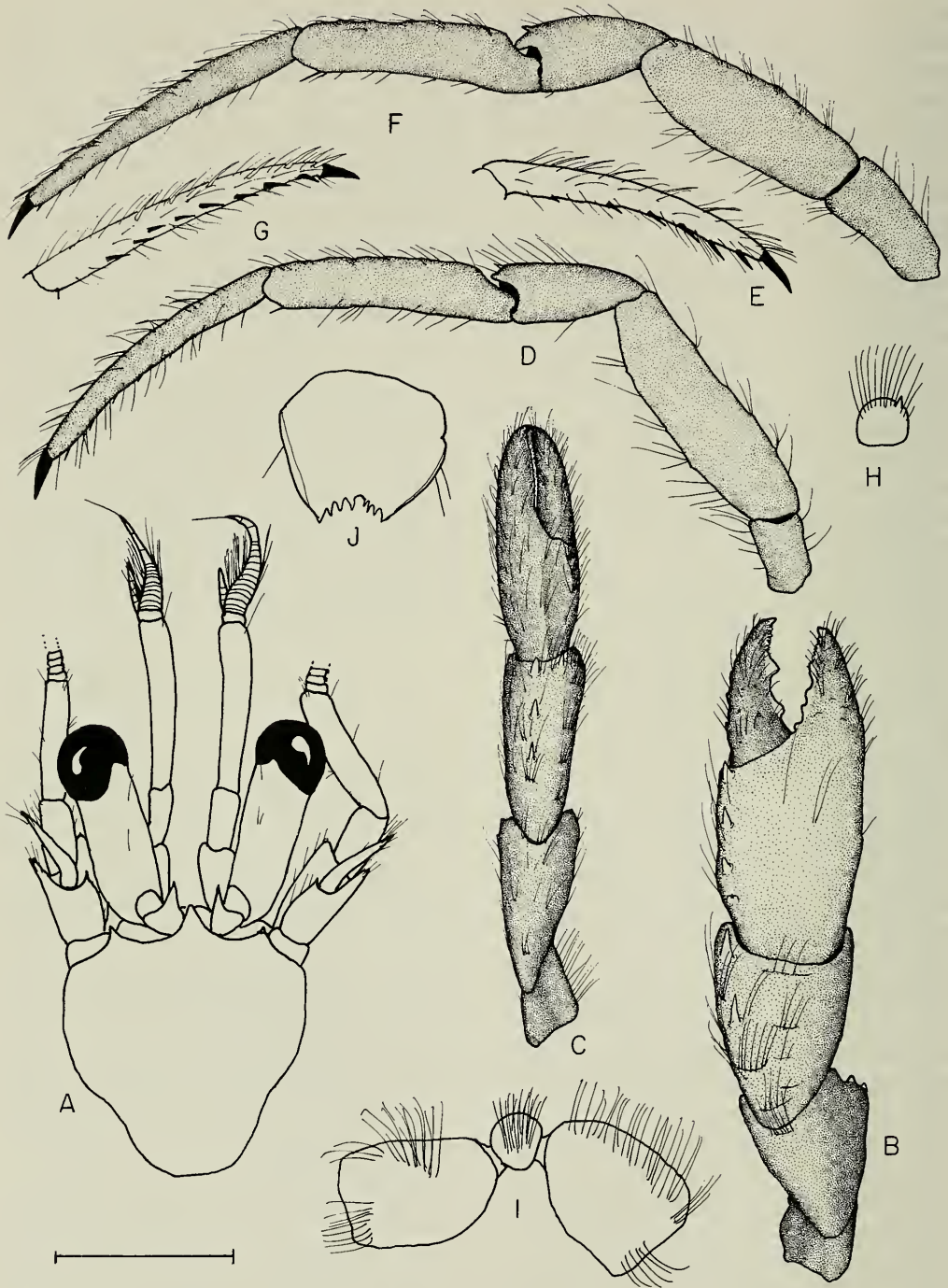


Fig. 4. *Laurentia sibogae*, new species. Holotype, ZMA Crust.: De.201762: A, shield and cephalic appendages; B, right cheliped; C, left cheliped; D, right second pereopod (lateral view); E, dactyl of right second pereopod (mesial view); F, left third pereopod (lateral view); G, dactyl of left third pereopod (mesial view); H, anterior lobe of sternite of third pereopods; I, coxae and sternite of fifth pereopods; J, telson. Scales equal 1.0 mm (A-G) and 0.5 mm (H-J).



short setae on ventral surface. Penultimate segment glabrous. Basal segment with 1 small acute spine- on dorsolateral margin distally.

Antennal peduncles overreaching ocular peduncles by  $\frac{1}{3}$  to  $\frac{1}{2}$  length of ultimate segment. Fifth and fourth segments with scattered, moderately long setae. Third segment with very small spinule on ventrodistal margin. Second segment with dorsolateral distal angle produced, terminating in simple or bifid spine; dorsomesial distal angle with moderately strong spine. First segment with 1 acute spine ventrolateral margin distally. Antennal acicle moderately short, not reaching beyond proximal margin of ultimate peduncular segment. Antennal flagellum with 1 or 2 quite long and 1-4 shorter setae practically every article.

Third maxilliped with 7 or 8 small teeth on crista dentata; proximal 3 or 4 more prominent.

Right cheliped (Fig. 4B) with chela moderately slender. Dactyl only slightly longer than palm; dorsomesial margin with 3 low spinulose protuberances, dorsal surface with few scattered very small spinules and sparse tufts of long setae; cutting edge with 2 widely spaced large calcareous teeth in proximal  $\frac{2}{3}$  and few small calcareous teeth interspersed with corneous teeth distally. Palm with 4 widely-spaced spines or spinulose tubercles on dorsomesial margin, dorsal surface convex, apparently completely unarmed, but with scattered long setae, dorsolateral margin not delimited on palm, but marked by tufts of long, stiff setae on fixed finger, dorsal surface of fixed finger also with numerous low protuberances and tufts of long, stiff setae; cutting edge with 2 large and several smaller calcareous teeth; ventral surfaces of dactyl, palm, and fixed finger all with tufts of long setae. Carpus approximately as long as palm; dorsomesial margin with 2 widely spaced, strong spines and proximal transverse row of long stiff setae, dorsal surface with few transverse rows of long, stiff setae, dorsolateral margin not delimited, lateral and ventral surfaces

with scattered long setae, 1 acute spinule at ventrolateral distal angle. Merus approximately as long as carpus; dorsodistal margin with long setae, and few scattered long setae on dorsal surface; ventrolateral margin with 2 spines in distal half, ventromesial margin with small spine at distal angle. Ischium unarmed, but with few long setae.

Left cheliped (Fig. 4C) with moderately long slender chela; dactyl and fixed finger lacking distinct hiatus, and not noticeably curved ventrally. Dactyl slightly longer than palm; dorsal and ventral surfaces unarmed, but with numerous tufts of long setae. Palm somewhat elevated in midline, perhaps minutely serrate and with long setae, dorsomesial and dorsolateral faces sloping, unarmed but with scattered long setae. Carpus approximately  $\frac{1}{3}$  longer than palm, covered dorsally, mesially and to lesser extent laterally and ventrally with long setae; dorsomesial distal angle with acute spine, dorsolateral margin with row of 3 acute, rather widely-spaced spines and long setae; ventrolateral distal angle with acute spine. Merus approximately equaling length of carpus; dorsal and ventral surfaces with scattered long setae; ventrolateral margin with 2 acute spines distally, ventromesial margin with 1 acute spine at distal angle. Ischium with long setae on ventral margin.

Ambulatory legs (Fig. 4D-G) generally similar from left to right; dactyls slender,  $\frac{1}{4}$  to  $\frac{1}{3}$  longer than propodi; terminating in long slender corneous claws; dorsal margins each with row of long, corneous, spine-like bristles in distal  $\frac{2}{3}$  and long setae, ventral margins each with row of corneous spines (6 to 8) in distal  $\frac{3}{4}$  or slightly more and additional long setae; mesial and lateral faces with scattered setae. Propodi with 1 corneous spinule at least on left second and third; dorsal and ventral surfaces all with tufts of long setae. Carpi each with small almost transparent spine at dorsodistal margin, few long setae on dorsal and ventral margins. Meri with long setae dorsally and ventrally. Ischia also with long setae on ventral margins. Fourth pereopod without

preungual process at base of claw; carpus without dorsodistal spine. Sternite of third pereopods (Fig. 4H) with anterior lobe roundly subquadrate, anterior margin with long setae and 1 spine. Sternite of fifth pereopods (Fig. 4I) subovate, with median tuft of long setae.

Telson (Fig. 4J) with transverse suture indicated in part by tuft of setae (left side); terminal margins oblique, each with 4 spines, stronger on left and/or at outer angles.

*Affinities.*—Of the four species of *Laurentia* currently recognized, *L. sibogae* appears most closely related to *L. balli* new species. In both species the dorsomesial margin of the right chela is similarly armed with a row of spines; however, the dactyl of the right chela has only a few low protuberances in *L. sibogae*, whereas in *L. balli* this margin is provided with a row of spines; the dorsal surfaces of the palm and fixed finger have a few small spines. Additionally, the dorsodistal margin of the carpus of the right cheliped is unarmed in *L. sibogae*, but carries a prominent median spine in *L. balli*.

*Etymology.*—Named for the Dutch research vessel "Siboga."

*Distribution.*—At present, known only from the type locality; 18 m.

*Laurentia balli*, new species  
Fig. 5

*Anapagridentes* sp.: Haig & Ball, 1988:177, Fig. 8.

*Holotype.*—♂ (SL = 2.0 mm), off Pulau, Saparua, Indonesia, 3°37.9'S, 128°38.6–39'E, *Alpha Helix* Saparua station 3, 29 Mar 1975, coll. E. Ball, NIOJ.

*Description.*—Shield (Fig. 5A) approximately as long as broad; anterior margin between rostrum and lateral projections concave; anterolateral margins sloping; posterior margin roundly truncate. Rostrum triangular, produced beyond bases of ocular acicles, terminating subacutely. Lateral projections well developed, triangular, termi-

nating acutely and with marginal or submarginal spinule.

Ocular peduncles approximately equaling length of shield, cylindrical, with corneae slightly dilated. Ocular acicles narrowly triangular, with small marginal or submarginal spine.

Antennular peduncles (when extended) overreaching corneae by  $\frac{1}{2}$  to  $\frac{2}{3}$  length of ultimate segment. Ultimate segment with 1 or 2 long setae on dorsodistal margin. Penultimate segment with few scattered setae. Basal segment with statocyst area broad and dorsoventrally flattened, with acute, curved spine on lateral margin.

Antennal peduncles equaling or slightly overreaching distal margins of corneae. Fifth and fourth segments with few scattered setae. Third segment with acute spine on ventral margin. Second segment with dorsolateral distal angle produced, terminating in acute spine, lateral margin with few setae; dorsomesial distal angle with moderately strong spine, mesial and lateral surfaces with few long setae. First segment with spinule on dorsolateral distal angle and 1 acute spine ventrolaterally. Antennal acicle reaching beyond base of fifth peduncular segment, slightly arcuate, terminating in small spine and 1 to 3 long setae. Antennal flagellum moderately short, with 1 or 2 long and 0 to 4 short setae every article.

Crista dentata of third maxilliped with 10 to 13 small teeth, most proximal 3 largest.

Right cheliped with dactyl slightly shorter than palm; dorsomesial margin with row of very small, moderately widely-spaced spinules, surfaces all with numerous long setae; cutting edge with 2 prominent calcareous teeth in proximal half, row of small calcareous teeth distally; terminating in small corneous claw. Palm (Fig. 5B) slightly shorter than carpus; dorsomesial margin with row of 4 slender spines, dorsolateral margin not delimited, dorsal surface with scattered setae and few spinules laterally, more numerous on fixed finger; lateral face with short transverse rows of long setae; cutting edge of fixed finger with 2 promi-

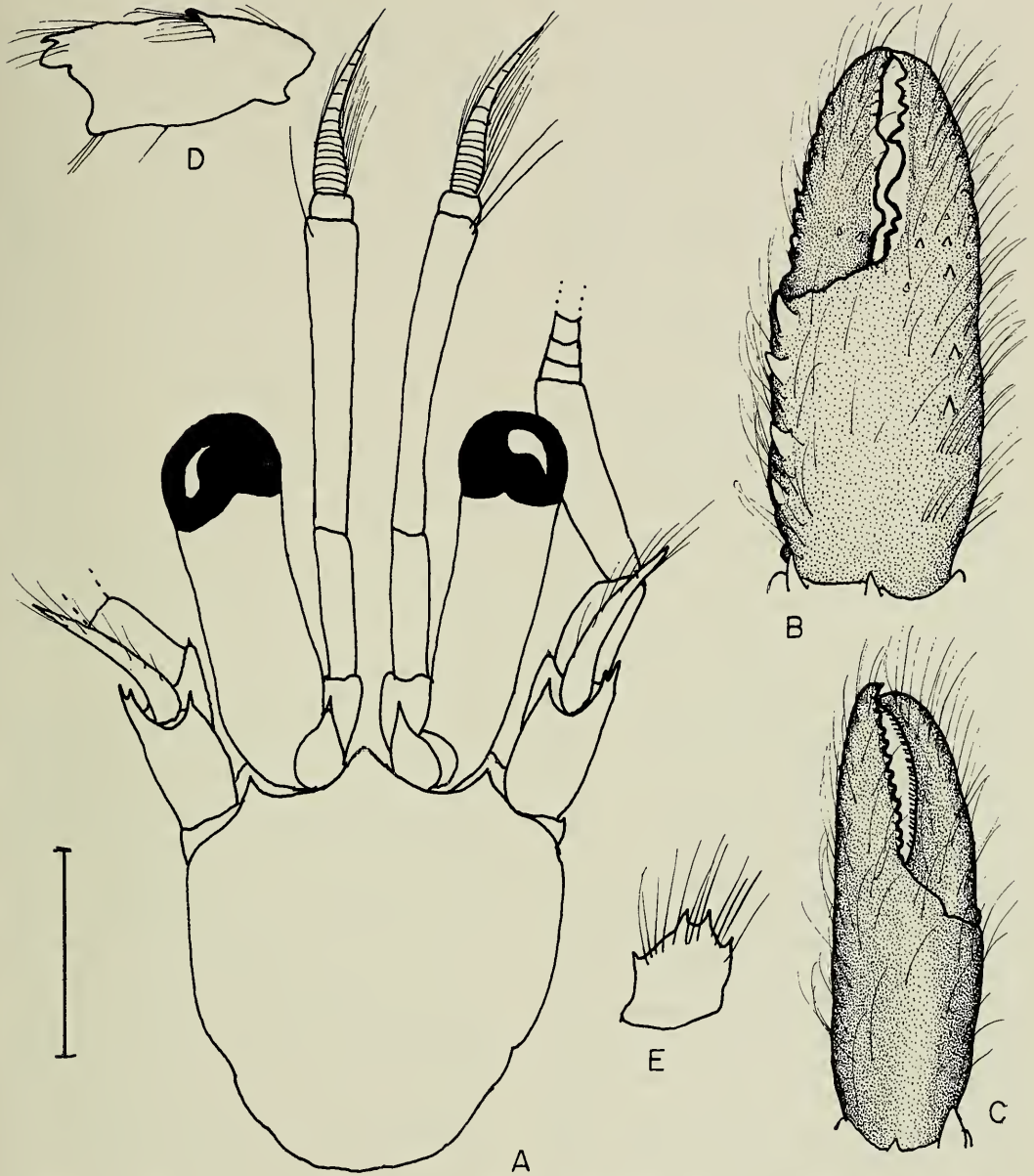


Fig. 5. *Laurentia balli*, new species. Holotype, NIOJ: A, shield and cephalic appendages; B, chela of right cheliped; C, chela of left cheliped; D, carpus of second right pereopod (mesial view); E, anterior lobe of sternite of third pereopods. Scale equals 1.0 mm (A–D) and 0.5 mm (E).

ment and 2 smaller calcareous teeth proximally, row of small calcareous teeth distally. Carpus slightly longer than merus; dorsomesial margin with 2 widely-spaced acute spines distally and 2 spinulose protuberances proximally, 1 additional spine

on distal margin medially; ventrolateral margin with acute spine distally; all surfaces with scattered tufts of long setae. Merus subtriangular; dorsal margin with tufts of moderately long setae; ventrolateral distal angle with acute spine and tuft of long

setae. Ischium with scattered long setae dorsally and ventrally.

Left chela (Fig. 5C) with distinct hiatus between dactyl and fixed finger. Dactyl slightly longer than palm; unarmed but with long setae on mesial face; cutting edge with row of small corneous teeth, terminating in small corneous claw. Palm with dorsal surface slightly elevated in midline, with few scattered moderately short setae mesially and laterally, dorsolateral margin with long setae, more numerous on fixed finger; cutting edge of fixed finger with row of small calcareous teeth. Carpus slightly longer than palm, approximately equaling length of merus; dorsolateral margin with row of 3 widely-spaced spines, dorsomesial margin with 1 strong spine distally and 3 short, transverse ridges and long setae in proximal  $\frac{2}{3}$ , extending onto mesial face dorsally; lateral face with scattered somewhat shorter setae. Merus subtriangular; dorsal margin with row of moderately long setae; ventromesial margin with long setae and 1 acute spine at distal angle; ventrolateral margin row of long setae and 2 prominent spines in distal half. Ischium damaged in holotype.

Ambulatory legs with dactyls at least  $1\frac{1}{2}$  times longer than propodi; in lateral view, straight (second left missing in holotype) or curved (third); dorsal surfaces each with row of long, moderately stiff setae; mesial and lateral faces each with few scattered setae; ventral margins each with 6 corneous spines in distal  $\frac{2}{3}$ . Propodi with scattered setae dorsally and ventrally; ventrodiscal margins each with corneous spine. Carpi each with small spine on dorsal surface near distal angle, second (Fig. 5D) with additional small spine in proximal half, long setae dorsally and to lesser extent ventrally. Meri and ischia with long setae dorsally and ventrally. Fourth pereopod with unarmed carpus. Sternite of third pereopods with anterior lobe (Fig. 5E) roundly subquadrate, with 4 small marginal spines. Sternite of fifth pereopods subquadrate, with long marginal setae.

Telson (now missing from holotype) with

transverse suture not distinct; posterior lobes markedly asymmetrical, with terminal margins oblique, each with 3 or 4 spines, strongest at outer angle, lateral margin of left with narrow corneous plate.

*Affinities.*—As previously mentioned, *L. balli* appears most closely allied to *L. sibogae*. In addition to the characters already cited that separate the two species, there are differences in the armature of the anterior lobe of the sternite of the third pereopods and the asymmetry of the telsonal lobes. In *L. balli*, the anterior lobe of the sternite carries 4 marginal spines; only 1 is present in *L. sibogae*. The posterior lobes of the telson are strongly asymmetrical in *L. balli*, but very weakly so in *L. sibogae*.

*Etymology.*—It gives us great pleasure to name this species for Eldon E. Ball, in recognition of his work on Pacific hermit crabs.

*Distribution.*—Saparua and possibly Banda, Indonesia.

*Remarks.*—The figures of “*Anapagridentes* sp.” (Haig & Ball 1988) are generally diagrammatic, and some do not accurately depict certain characters. Specifically, the dorsolateral distal angle of the second antennal peduncular segment is illustrated as a simple spine; however, there actually is a second spine on the mesiodistal margin; the first peduncular segment has a small spinule at the dorsolateral distal angle. The dactyl, fixed finger, and dorsolateral surface of the palm of the right cheliped appear unarmed in Haig & Ball’s Fig. 8B. As may be seen in our figure (Fig. 5B), the dactyl has a few small spines on the dorsomesial margin and there are a few small spines laterally on the palm; on the fixed finger, a few spinules are present on the dorsal surface proximally and on the dorsolateral margin. The right second pereopod appears to have only a dorsodistal spine on the carpus in Haig & Ball’s fig. 8E. In lateral view, the typical second spine on the proximal half of the dorsal surface is not readily observable; however, in mesial view (Fig. 5D) it is quite obvious.

One ♂ (SL = 2.32 mm, ZMA Crust.: De.201765) lacking chelipeds and ambulatory legs, from "Siboga" station "Banda," is tentatively assigned to *L. balli*. It shares with the holotype the strongly asymmetrical telsonal lobes, and similarly armed anterior lobe of the sternite of the third pereopods. However, as variation among species of *Laurentia* is not known, we are not considering this Banda specimen a paratype.

*Laurentia senticosa*, new species  
Figs. 3E, 6

*Holotype*.—♂ (SL = 1.79 mm), Seram Ceram, Indonesia, 02°28.5'S, 131°3.3'E, Siboga station 166, 118 m, 22 Aug. 1899, ZMA Crust.: De.201760a.

*Paratypes*.—1 ♂, 1 ♀ (SL = 1.28, 1.40 mm), Seram Ceram, Indonesia, 02°28.5'S, 131°3.3'E, Siboga station 166, 118 m, 22 Aug 1899, ZMA Crust.: De.201760b.

*Description*.—Shield (Fig. 6A) slightly to considerably longer than broad; anterior margin between rostrum and lateral projections concave; anterolateral margins sloping or terraced; posterior margin truncate. Rostrum triangular, well developed, reaching approximately half length of ocular acicles, terminating bluntly or subacutely. Lateral projections well developed, triangular, with marginal or submarginal spine.

Ocular peduncles subcylindrical, approximately  $\frac{2}{3}$  shield length; corneae dilated. Ocular acicles subtriangular, with small submarginal spine.

Antennular peduncles overreaching ocular peduncles by about  $\frac{4}{5}$  length of ultimate segment; ultimate segment with 1 or 2 long, simple or plumose setae on dorsodistal margin; penultimate segment glabrous; basal segment with statocyst region expanded laterally and dorsoventrally flattened, dorsolateral margin with long slender spine distally.

Antennal peduncles overreaching ocular peduncles by  $\frac{2}{3}$ – $\frac{3}{4}$  length of ultimate segment. Fifth and fourth segments with few long setae. Third segment unarmed or with

small ventrodistal spinule. Second segment with dorsolateral distal angle produced, terminating in acute spine and sometimes with prominent slender spine. First segment with small spine on ventrolateral margin distally. Antennal acicle reaching to base of cornea or slightly beyond, terminating in acute spine and with long setae on mesial margin. Antennal flagellum missing.

Crista dentata with 5–10 large or irregularly-sized teeth, largest 3 or 4 often proximal.

Right cheliped (Figs. 3E, 6B) moderately long and stout; with hiatus between dactyl and fixed finger. Dactyl approximately  $\frac{2}{3}$  length of palm; cutting edge with 2 widely-spaced calcareous teeth in proximal  $\frac{2}{3}$ , row of very small calcareous teeth distally; terminating in very small corneous claw; dorsomesial margin with row of very small spines; dorsal surface convex, with scattered long setae, midline with irregular rows of very small spinules; ventral and mesial surfaces also with scattered long setae. Palm as long or slightly longer than carpus; dorsomesial margin not delimited, dorsal surface convex, armed with scattered, very fine spinules extending onto mesial face and few scattered long setae, dorsolateral margin with few long setae but otherwise not delimited proximally, with fine spinules distally and on fixed finger; dorsal surface of fixed finger with scattered fine spinules and long setae; cutting edge with 3 broad calcareous teeth, terminating in small corneous claw. Carpus approximately equal to length of merus; dorsomesial margin with row of moderately slender, acute spines, dorsal surface with 2 to 4 irregular longitudinal rows of small spinules, dorsolateral margin not delimited; mesial face with transverse rows of long setae, lateral and ventral surfaces also with scattered long setae. Merus with transverse rows of setae on dorsal margin, extending onto lateral face dorsally; ventrolateral margin with 2 prominent spines distally, ventromesial margin with 1 prominent spine at distal angle, 1 additional spine originating from se-

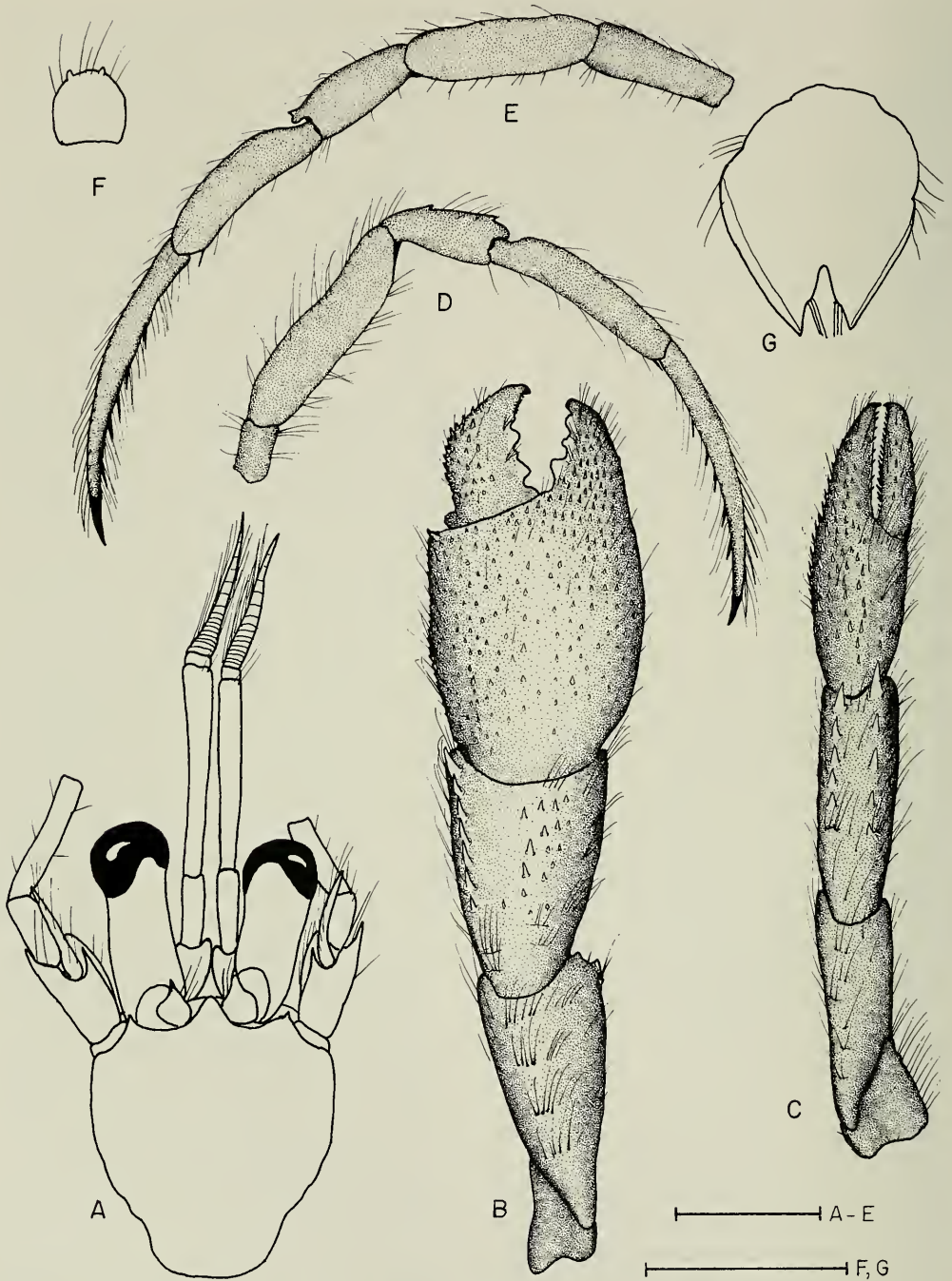


Fig. 6. *Laurentia senticosa*, new species. Holotype, ZMA Crust.: De.201760a: A, shield and cephalic appendages; B, right cheliped; C, left cheliped; D, right second pereopod (lateral view); E, left third pereopod (lateral view); F, anterior lobe of sternite of third pereopods; G, telson. Scale equals 1.0 mm (A-E) and 0.5 mm (F, G).

tal protuberance at midlength, and 1 transverse setal row and smaller spine proximally. Ischium with setae mesially and ventrally. Coxa sometimes with prominent spine on ventrolateral distal angle.

Left cheliped (Fig. 6C) slender; not appreciably shorter than right but much less robust. Dactyl approximately equal to or slightly longer than palm; cutting edge with row of very small corneous teeth, terminating in corneous claw; dorsal surface convex, with 4 or 5 spinules and tufts of long setae in midline, low protuberances and long setae on dorsomesial margin. Palm about  $\frac{2}{3}$  length of carpus; dorsal surface convex, armed with irregular longitudinal rows of tiny spinules, fewer on dorsomesial side and on fixed finger, dorsolateral margin with row of slender acute spines; palm and fixed finger both with scattered long setae; cutting edge of fixed finger with row of widely-spaced corneous teeth, terminating in small corneous claw; ventral surfaces all with weakly defined short transverse rows of long setae. Carpus approximately as long as merus; dorsolateral margin with row of slender, acute spines, dorsomesial margin also with row of spines strongest distally, both rows partially obscured by long setae; mesial and ventral faces with transverse rows of long setae; lateral face with scattered long setae, ventrolateral margin with acute spine distally. Merus with long setae on dorsal, lateral and ventral surfaces; ventrolateral margin with 2 prominent acute spines distally, continued as row of smaller spinules on lateral face ventrally; ventromesial margin with 1 spine near distal angle. Ischium with long setae on ventral margin. Coxa with prominent spine at ventrolateral distal angle.

Second and third pereopods (Fig. 6D, E) (holotype with only third left remaining) generally similar from left to right. Dactyls slightly to considerably longer than propodi, slender; in dorsal view, slightly twisted; in lateral view, curved ventrally; terminating in long, slender corneous claws; dorsal margins each with a row of stiff setae, me-

sial faces with long setae, ventral margins also with long setae and 5–8 long corneous spines in middle half to  $\frac{2}{3}$ . Propodi with 1 or 2 corneous spines on ventrodiscal margin, long setae dorsally and ventrally. Carpi each with 1 spine on dorsal surface adjacent to dorsodiscal angle (third) and 1 additional spine on dorsal surface proximally (second). Meri each with 1 spine on ventral margin in distal third (second) or unarmed (third), dorsal margins with tufts of long setae. Ischia unarmed. Fourth pereopod with small preungual process at base of claw; carpus unarmed. Sternite of third pereopods with small, subovate or subtriangular anterior lobe (Fig. 6F) usually with 1 or 2 marginal spines.

Telson (Fig. 6G) with posterior lobes only slightly asymmetrical, each outer angle acutely developed and 1 or 2 slight protuberances and tufts of setae on oblique terminal margins.

*Affinities.*—In having the dorsal surfaces of the palms of both chelipeds armed with spinules, *L. senticosa* closely resembles *L. albatrossae*. However, the two species are immediately distinguished by the presence in the latter species of a row of distinct spines on the dorsomesial margin of the palm of the right chela and the more numerous, smaller and more regular teeth of the crista dentata. The telsons of the two species are also distinctly different.

*Etymology.*—From the Latin *senticosus* meaning full of thorns, and referring to the spinulose dorsal surfaces of the chelae of this species.

*Distribution.*—Currently known only from the type locality, Seram Ceram, Indonesia.

## Discussion

As previously indicated, Melin's (1939) *Eupagurus (Spiropagurus) facetus* [also cited by Melin as *Eupagurus (Catapagurus) facetus*], not only was originally designated as the type species of *Anapagrides*, but, as the only nominal species assigned to the ge-

nus, must be considered the type species whether or not it agrees with the generic diagnosis given by De Saint Laurent-Dechancé (1966) (L. B. Holthuis, pers. comm.). As emended by McLaughlin & Sandberg (1995), *Anapagrides* sensu stricto is characterized as follows: 1) phyllobranchiate gills; 2) males with short sexual tube on right fifth coxa; 3) prominent accessory tooth on the crista dentata; 4) females with single gonopore on coxa of left third pereopod; 5) coxa of the male third left pereopod frequently with female-type gonopore. In contrast, *Laurentia* has: 1) trichobranchiate gills; 2) males with long sexual tube arising from the coxa of left fifth pereopod and provided with a terminal tuft of stiff setae; 3) no accessory tooth on the crista dentata; 4) females with paired gonopores; 5) males without female-type genital pore on coxa of left third pereopod.

All of the species presently recognized in *Laurentia* are morphologically quite similar. Among the materials reviewed initially by M. de Saint Laurent, is an additional lot from the *Siboga* Expedition, which is assignable, at least in part to *Laurentia*; however, none of the specimens are in sufficiently good condition now to permit us to assign them with confidence to any of the described taxa. *Siboga* station 260 contains the bodies of at least five specimens of *Laurentia*, but also representatives of at least two other genera. Of the remaining appendages, some most probably belong to the *Laurentia* specimens, but none can be matched with certitude to any of the bodies.

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